Blackwater River: Before and After

May 4, 2006
EPA Region 3 Conference

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DCR

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Overview

- Total Maximum Daily Loads (TMDLs) & Implementation Plans (IPs) in Virginia
- Background
- Blackwater River TMDL Development
- Blackwater River Implementation
- Blackwater River Post-TMDL & IP Monitoring

Partnerships

DEQ
Virginia Department of Environmental Quality

DCR
Department of Conservation & Recreation
Conserving Virginia's Natural & Recreational Resources

Monitoring & Assessment

303(d)/305(b) Integrated Report

Develop TMDL Plans

Assist with Implementation Plan Development

STAKEHOLDER INPUT

Assist in Development of NPS TMDLs

Develop Implementation Plan to meet TMDL

Provide Cost Share Funding

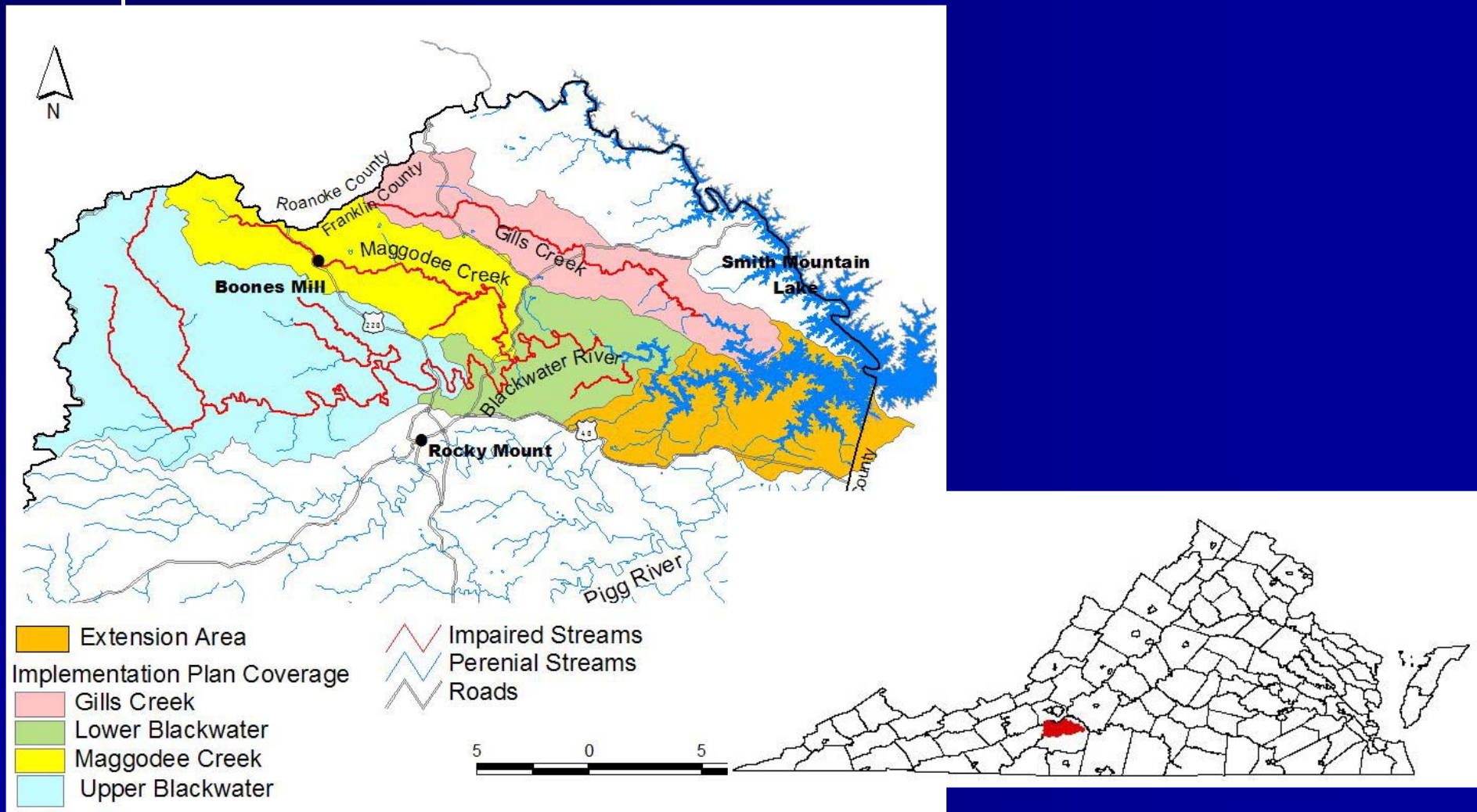
Blue Ridge Soil & Water Conservation District
http://va.nacdnet.org/brswcd

Background

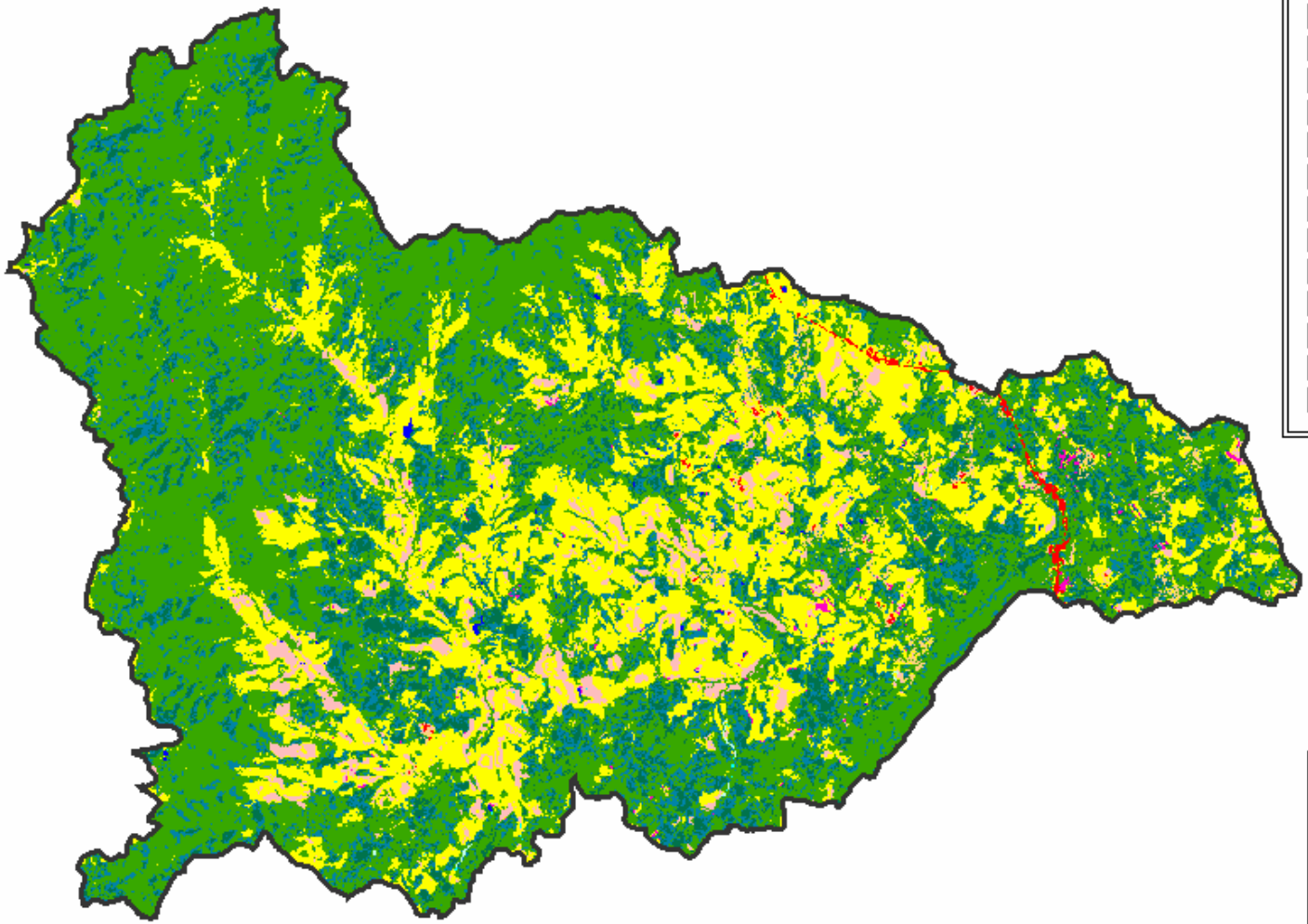
- 1972 Clean Water Act (CWA) and 1997 Water Quality Monitoring, Information, and Restoration Act (WQMIRA)
  - Monitor and Assess Water Quality
  - Periodically List streams that are NOT meeting Water Quality Standards
  - Develop TMDLs for Impaired Waters
  - Implement TMDLs

- 1998 lawsuit filed by the American Canoe Association and the American Littoral Society against EPA for failure to comply with CWA in Virginia → Consent Decree

Blackwater River and Gills Creek

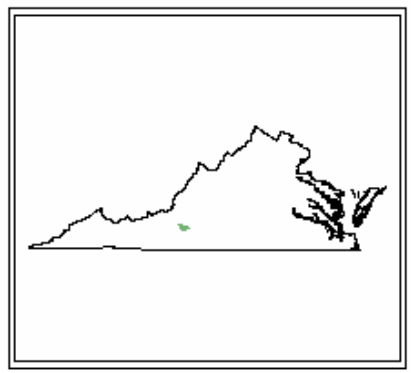


Blackwater River Watershed



Legend

- Blackwater River Watershed
- Open Water
- Low Intensity Residential
- High Intensity Residential
- Commercial/Industrial/Transportation
- Bare Rock/Sand/Clay
- Quarries
- Transitional
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Pasture/Hay
- Row Crops
- Small Grains
- Urban/Recreational Grasses
- Woody Wetlands
- Emergent/Herbaceous Wetlands



Blackwater River TMDL Development

- Impairments
  - Bacteria Standard
  - Aquatic Life Use Standard (Benthic Macroinvertebrate community)
- Approach
  - Misinformation was as common as cows in the river!
  - New strategy
    - Outreach
    - Solicit local SWCD support

Blackwater River TMDL Development

- TMDL
  - 100% reductions of straight pipes and livestock direct deposition
  - 35-75% reductions of wildlife direct deposits
- Bacteria Source Tracking (BST)
  - Results indicate the presence of the following bacteria sources: Human, Livestock, and Wildlife
  - All 3 sources detected in Blackwater River watershed

Blackwater River TMDL & IP Development

- Upper Blackwater TMDLs approved in 2001 & 2004
- North Fork, South Fork, Upper and Middle Blackwater River TMDL IP completed in 2001
- Lower Blackwater Bacteria TMDL Implementation Plan completed in 2006

Prior to TMDL Implementation Efforts

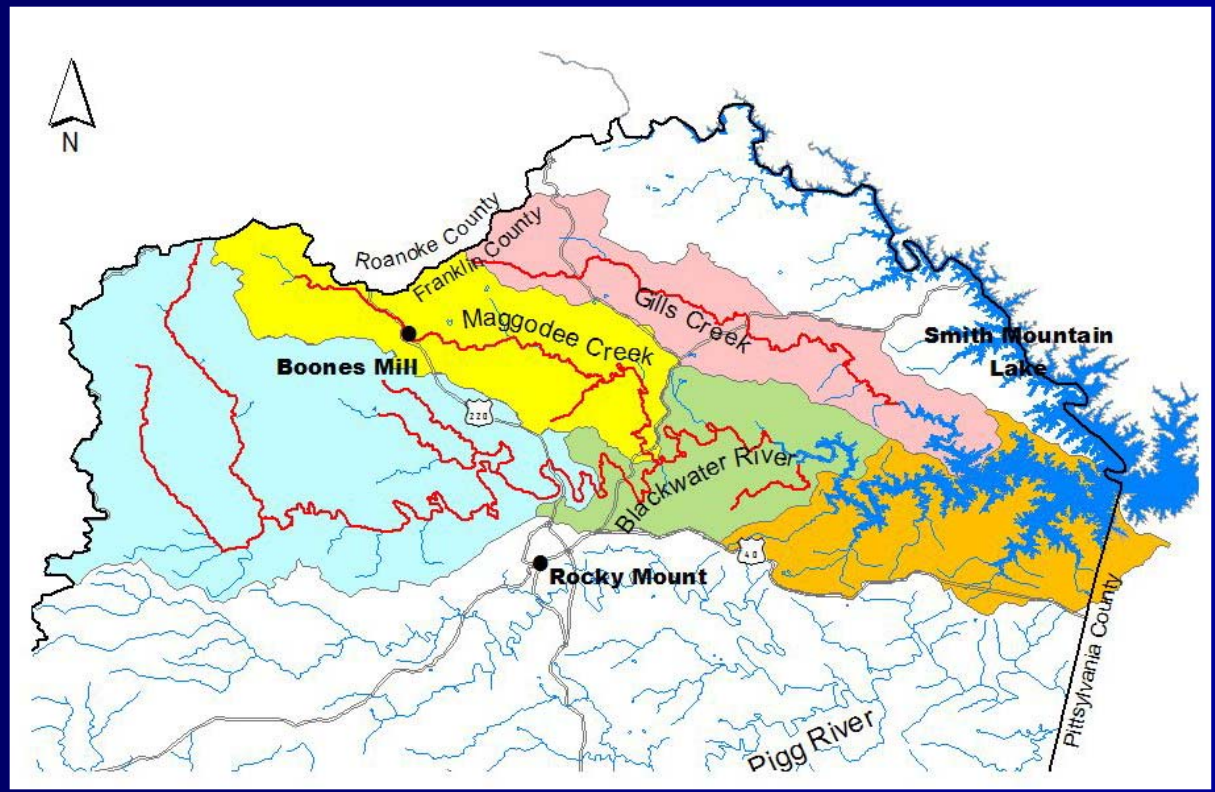
- In the 1990s several EPA 319 Grants were awarded in the Blackwater River watershed
  - Through Ferrum College and Blue Ridge Soil & Water Conservation District
  - Agricultural BMPs
  - Data Collection (Landuse/BMP data for TMDLs)

LifeSciences
FERRUM COLLEGE

Blue Ridge Soil & Water Conservation District
HTTP://VA.NACDNET.ORG/BRSWCD

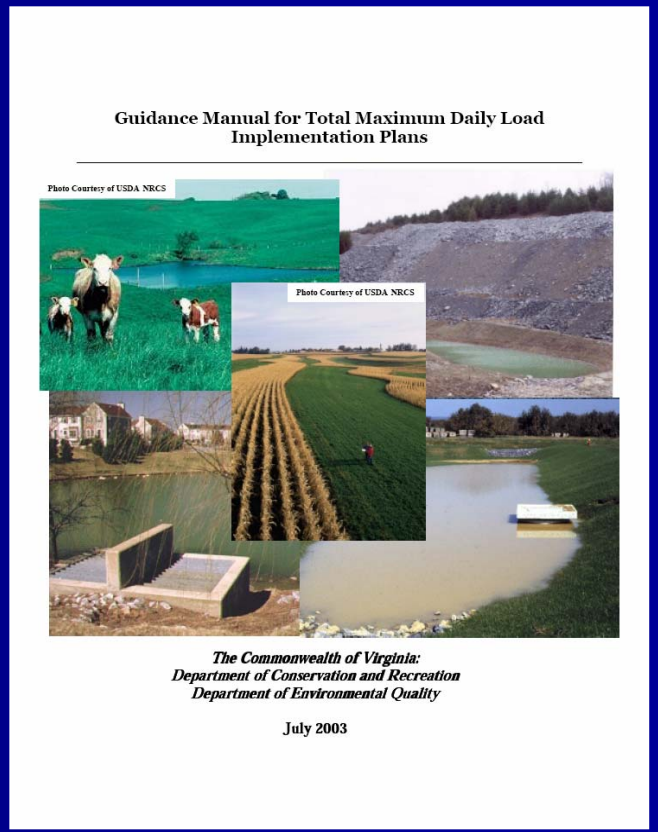
Upper Blackwater River Implementation

- North Fork, South Fork, Upper and Middle Blackwater River watersheds



Upper Blackwater Implementation Plan

- Implementation Plan (2001): Developed in cooperation with local citizens and stakeholders
- One of three pilot projects
- Designed to meet:
  - WQMIRA
  - 319 eligibility
  - EPA TMDL guidance



Upper Blackwater Implementation Plan

- Livestock exclusion and correcting failed septic systems and straight pipes were identified as BMPs needed to address bacteria
- Agricultural needs
  - 238 exclusion systems
  - 117 hardened crossings
  - 22.5 staff years (FTE)
  - $4.75 million
- Residential needs
  - 15 new systems
  - 1.5 staff years (FTE)
  - $150,000
- 5-year timeline

Upper Blackwater River Implementation

- Pilot implementation project administered by Blue Ridge SWCD began in Fall 2001
- Local staff provide
  - Technical assistance
  - Education and outreach

Upper Blackwater River Project

- A series of 13 BMPs addressing agricultural sources of bacteria and sediment are available to agricultural producers:

•Grazing land protection system •Stream Protection System
•Loafing lot management system •Hardened Crossings

•Stream bank stabilization •Vegetated cover on cropland
•Woodland buffer filter •Reforestation of cropland
•Small grain cover crop •Sod waterway
•Grass filter strips •Vegetated cover on critical areas
•Animal waste control facility

- 4 BMPs addressing residential sources of bacteria are available to homeowners:

•Septic connection to sewer •Septic system installation
•Alternative on-site system •Septic system repair

Upper Blackwater River Implementation

- Agricultural BMPs to date (19 producers)
  - Progress initially slow
  - 7.8 miles of stream fencing excluding 2,000 animals
  - 4 loafing lot management systems
  - 29 acres of riparian buffer, 4.7 acres of veg. cover on cropland and 2,700 feet of woodland buffer
- Agricultural BMPs under contract
  - 5 miles of stream fencing excluding 1,810 animals
  - 3 loafing lot management systems
  - 1 animal waste control facility

Upper Blackwater River Implementation

Upper Blackwater River Implementation

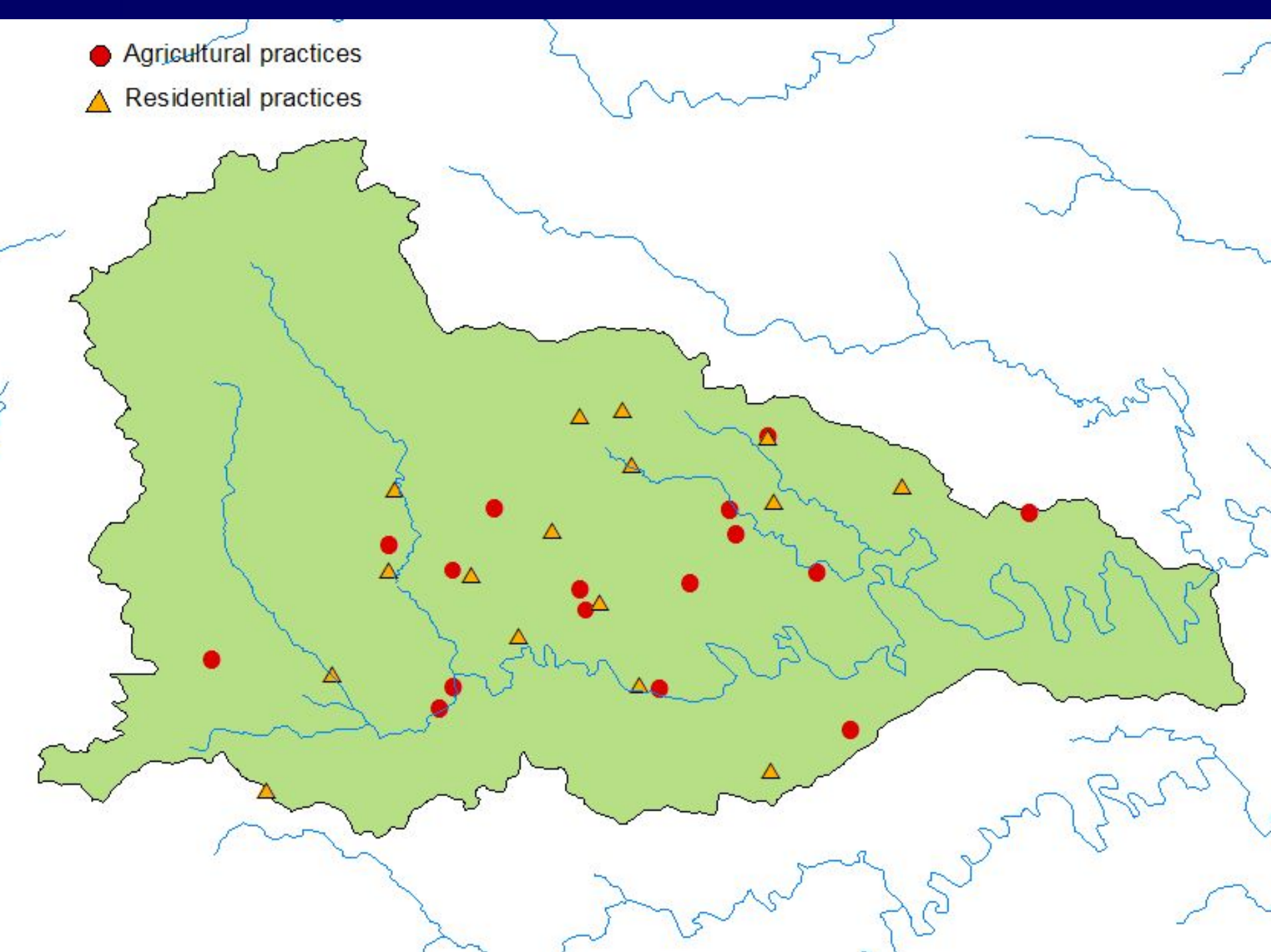
Upper Blackwater River Implementation

Upper Blackwater River Implementation

Upper Blackwater River Implementation

Upper Blackwater River Implementation

- Residential BMPs to date (19 landowners)
  - 15 new septic system
  - 3 septic system repairs
  - 1 alternative on-site system
- Residential BMPs under contract
  - 3 new septic systems
  - 1 connection to public sewer


Agricultural practices
Residential practices

Upper Blackwater River Implementation

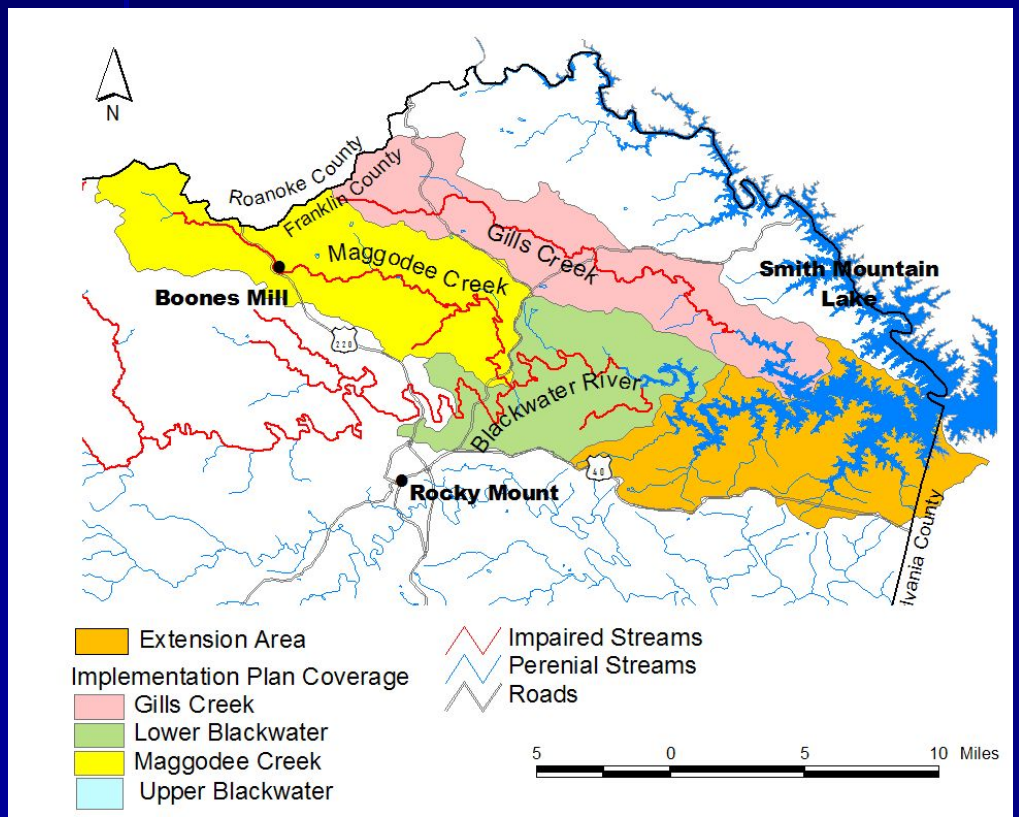
- Future of the project
  - Currently in 5th and most likely final year of the official implementation project
  - A project evaluation will be conducted at the end of the year
  - Potential funding sources for continued implementation (Virginia Ag BMP, Virginia WQIF)

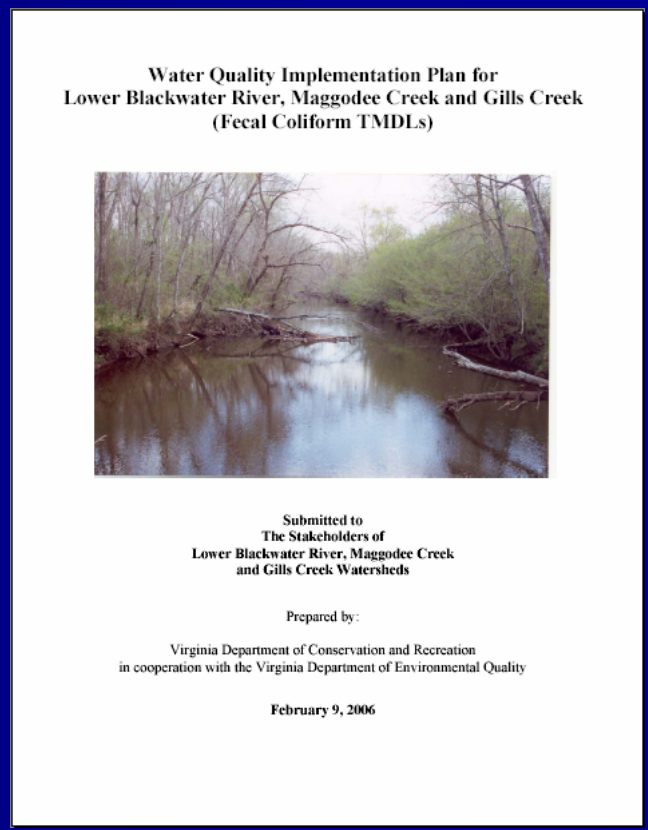
Upper Blackwater River Implementation

- Lessons Learned
  - Community “buy-in” is critical to project success
  - Word of mount and individual attention is worth 1,000 fliers
  - Significant reductions require new approaches by Soil & Water Conservation Districts

Lower Blackwater River Project

- Implementation plan for bacteria impairments completed January 2006
  - Good public participation and stakeholder “buy-in”





Water Quality Implementation Plan for
Lower Blackwater River, Maggodee Creek and Gills Creek
(Fecal Coliform TMDLs)

Submitted to
The Stakeholders of
Lower Blackwater River, Maggodee Creek
and Gills Creek Watersheds

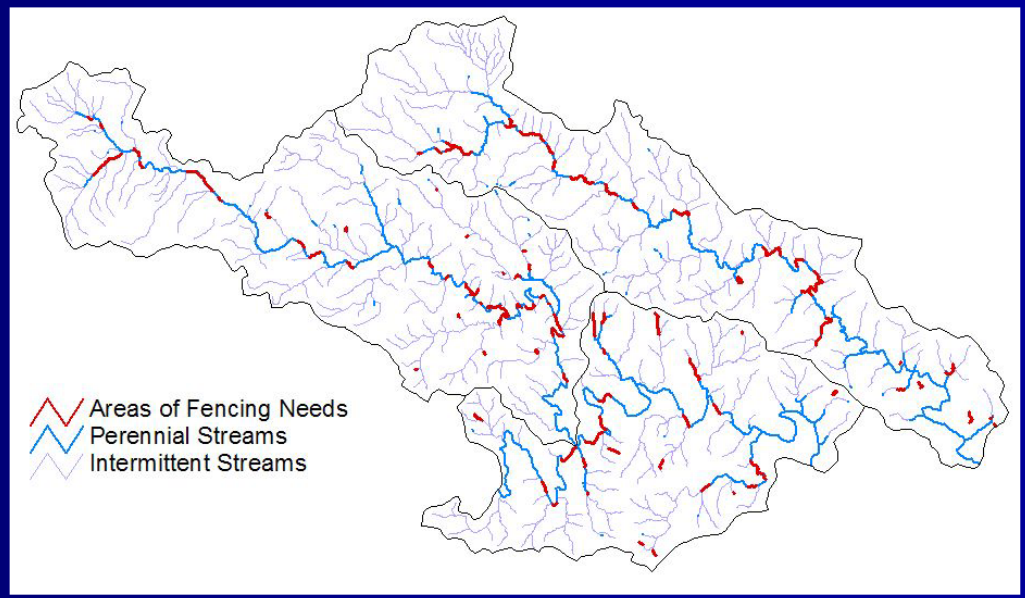
Prepared by:

Virginia Department of Conservation and Recreation
in cooperation with the Virginia Department of Environmental Quality

February 9, 2006

Lower Blackwater River Project

- Agricultural implementation needs
  - An additional 28 miles of streamside fencing needed
  - 77 livestock exclusion systems
  - 3 loafing lot management systems
  - 10 staff years (FTE)
  - $1.78 million



Lower Blackwater River Project

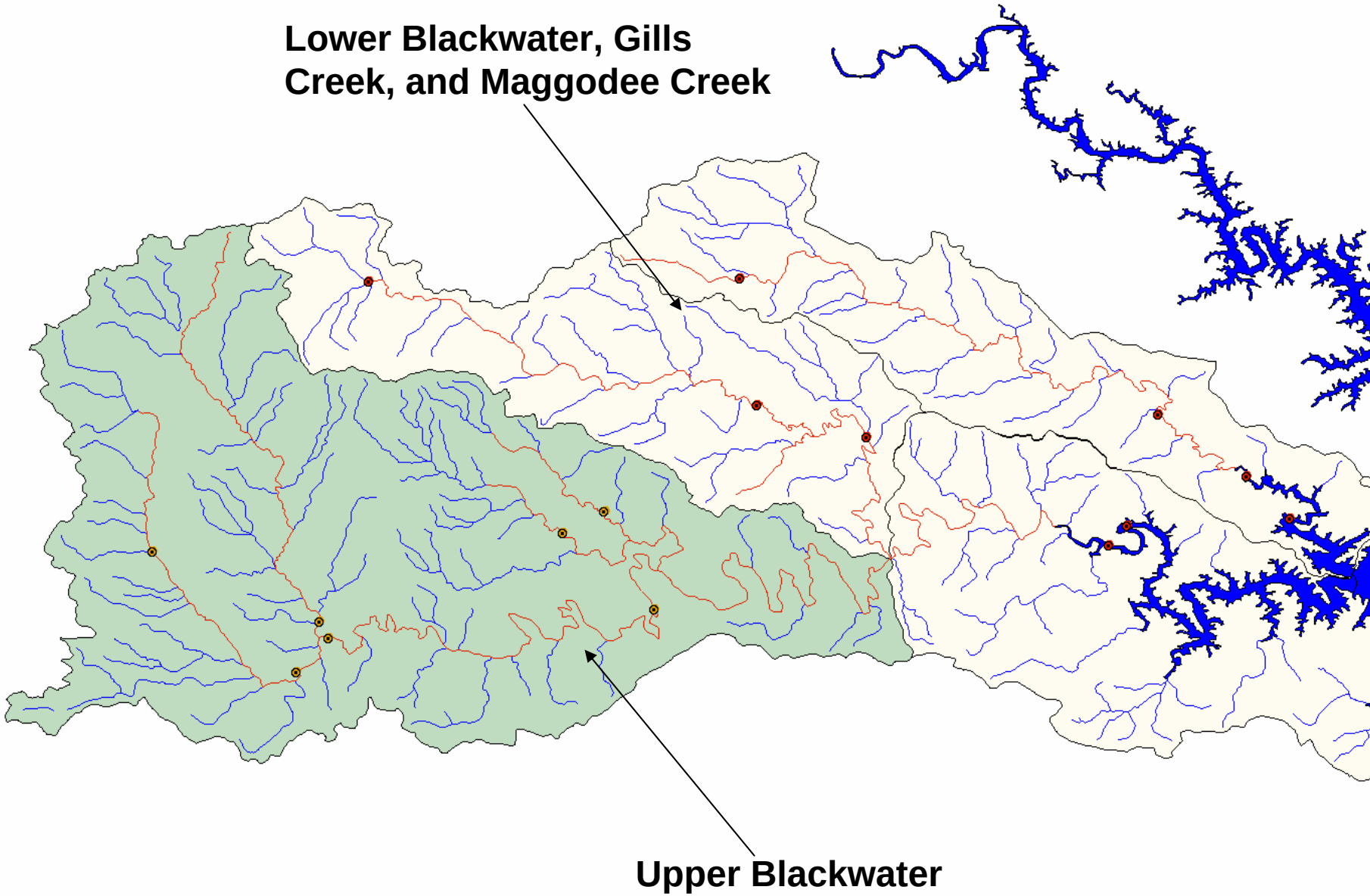
- Residential implementation needs
  - 26 straight pipes to be corrected (8 Lower Blackwater, 10 Maggodee, 8 Gills)
  - 34 failing septic systems to be corrected (6 Lower Blackwater, 8 Maggodee, 20 Gills)
  - 100 Septic Tank Pump-outs in Gills Creek
  - 5 staff years (FTE)
  - $677,500

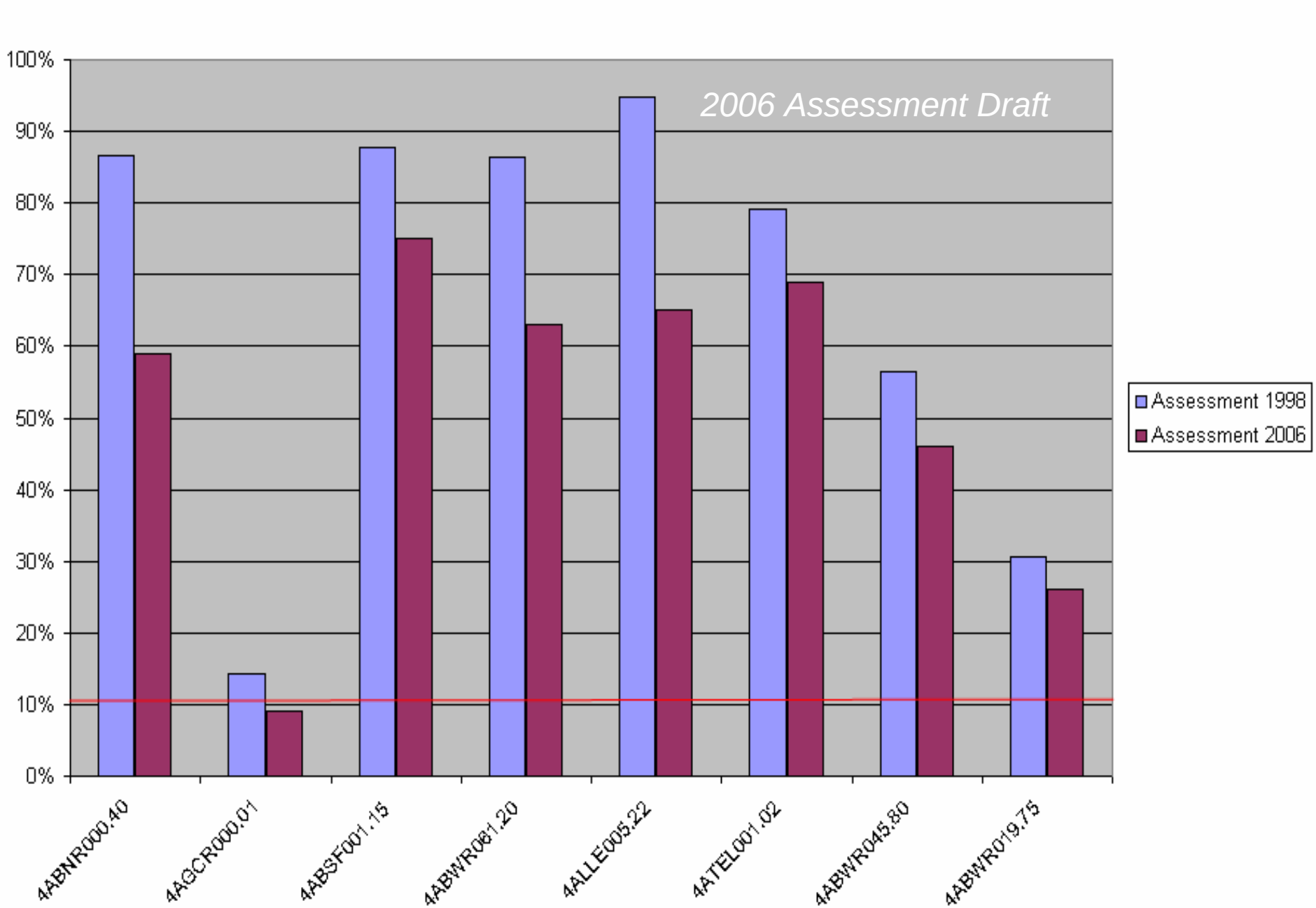
Lower Blackwater River Project

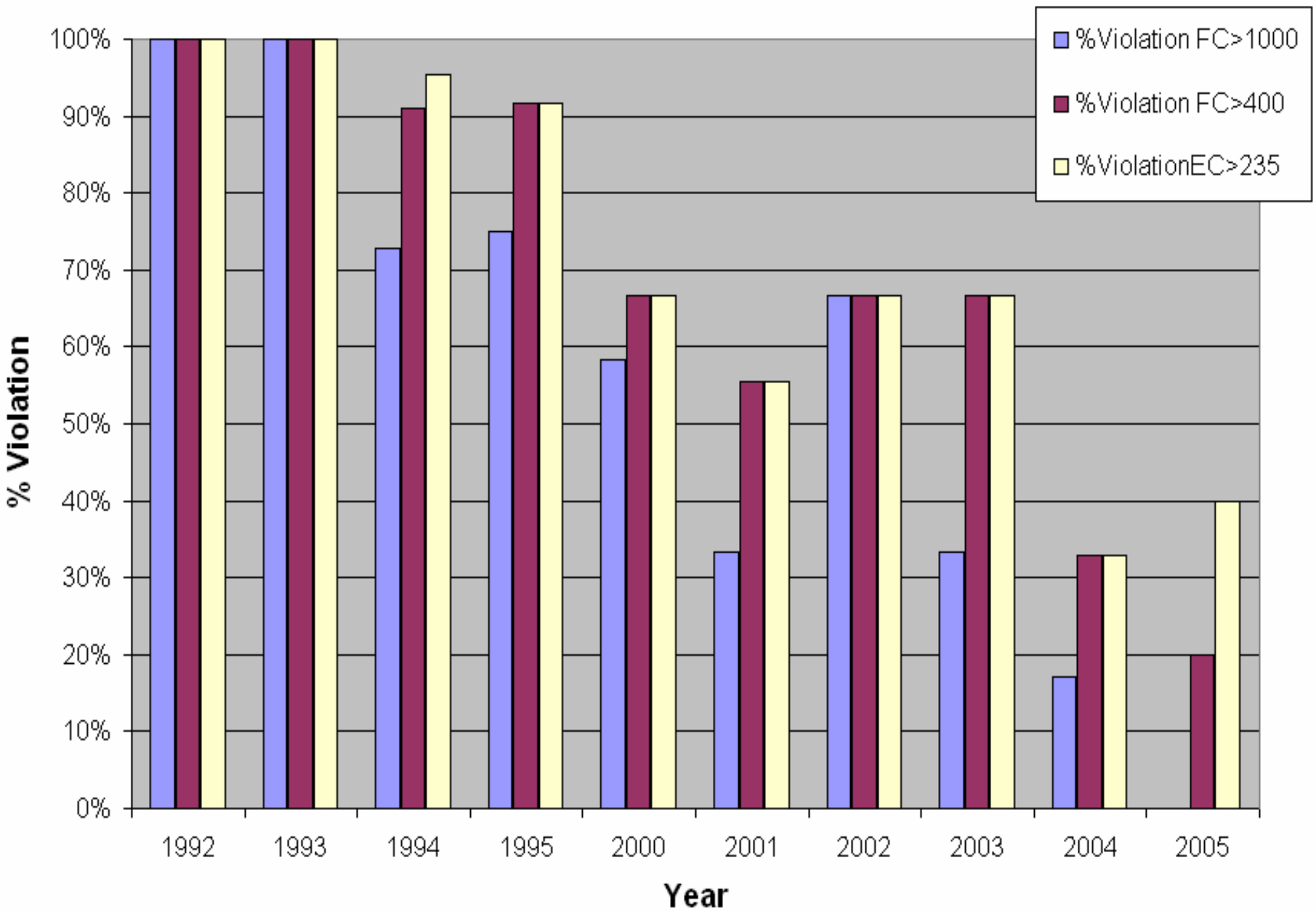
- Future of project
  - Implementation administered by the Blue Ridge SWCD began in March 2006
  - Blue Ridge SWCD is providing technical assistance, managing cost-share funds and providing educational and outreach services
  - Proposed 5-year project
  - Funding through 319 and Virginia BMP programs

Post TMDL & IP Monitoring

- VADEQ maintains 7 water quality monitoring stations in the Upper Blackwater River to evaluate implementation efforts
- VADEQ plans on monitoring 9 stations to evaluate implementation efforts for the Lower Blackwater River and tribs
- Two stations (4ABWR032.32 & 4ABWR019.72) are Zipper Trend Stations


Lower Blackwater, Gills Creek, and Maggodee Creek
Upper Blackwater


% Bacteria Violations By Assessment Period
2006 Assessment Draft
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Assessment 1998
Assessment 2006
4ABNR000.40
4AGCR000.01
4ABSF001.15
4ABWR061.20
4ALLE005.22
4ATEL001.02
4ABWR045.80
4ABWR019.75


N.F. Blackwater (4ABNR000.40)
%Violation FC>1000
%Violation FC>400
%ViolationEC>235
100%
90%
80%
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60%
50%
40%
30%
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10%
0%
% Violation
1992
1993
1994
1995
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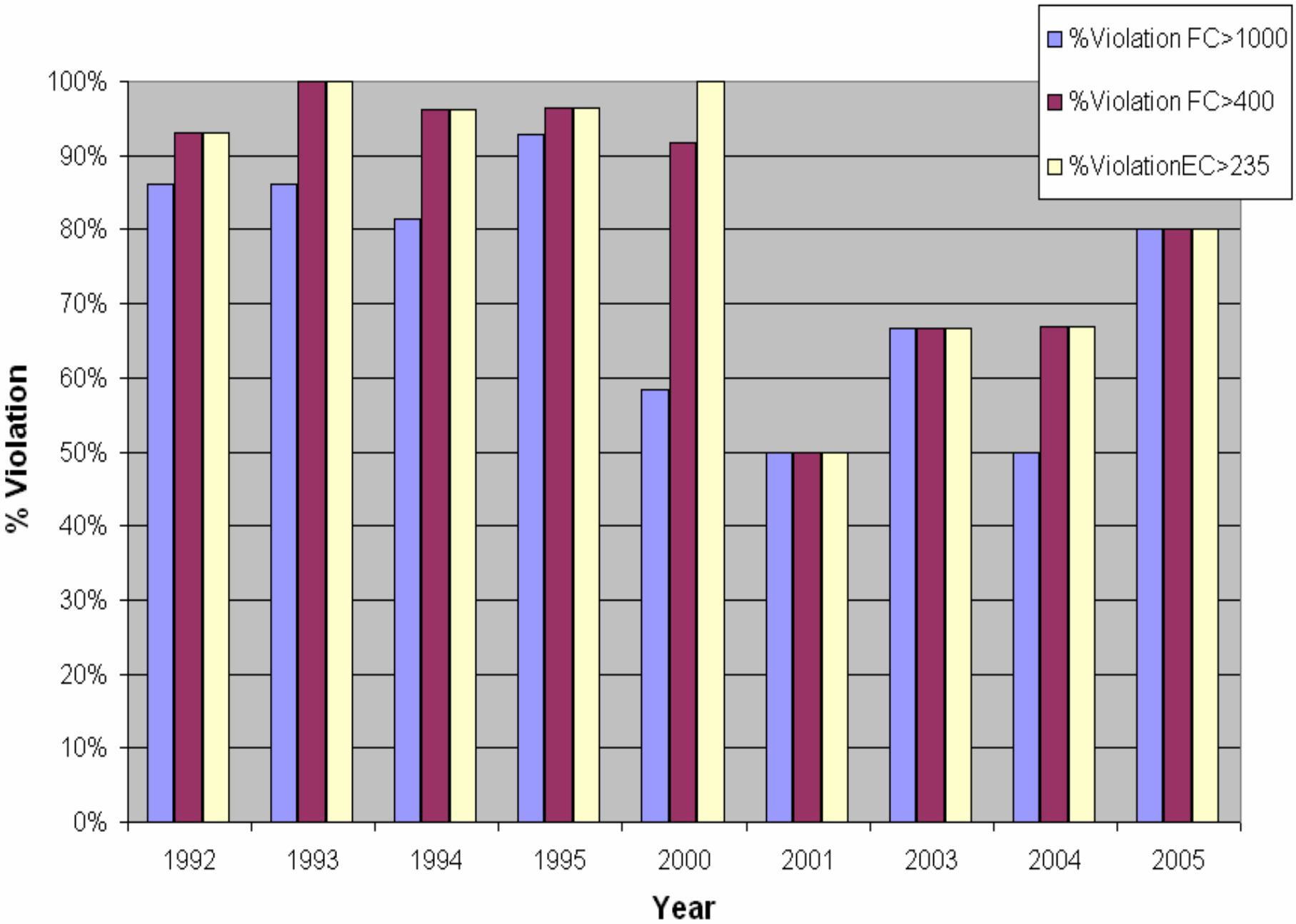
Year


SF, Blackwater (4ABSF001.15)
%Violation FC>1000
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%ViolationEC>235
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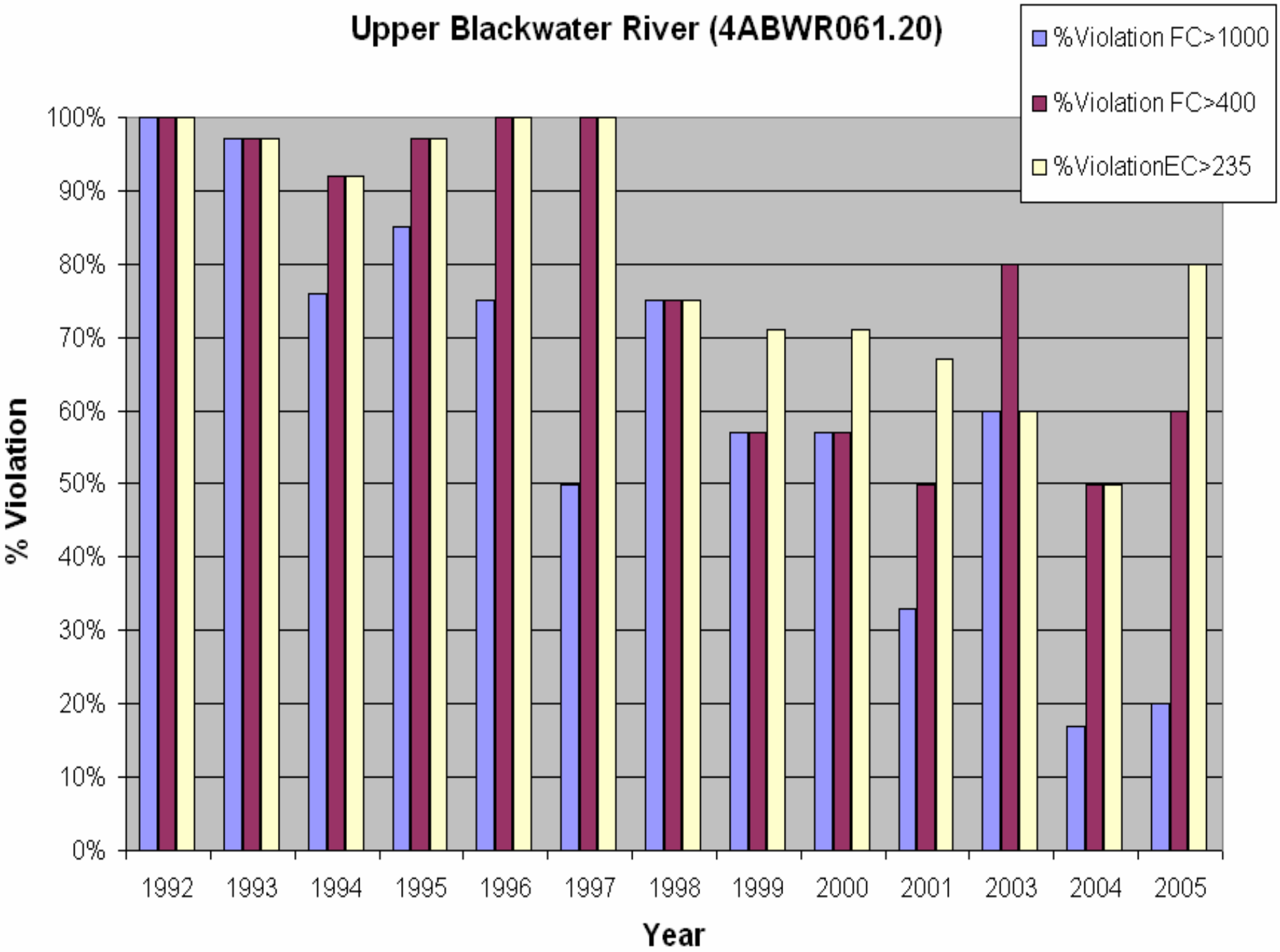
Upper Blackwater River (4ABWR061.20)
%Violation FC>1000
%Violation FC>400
%ViolationEC>235
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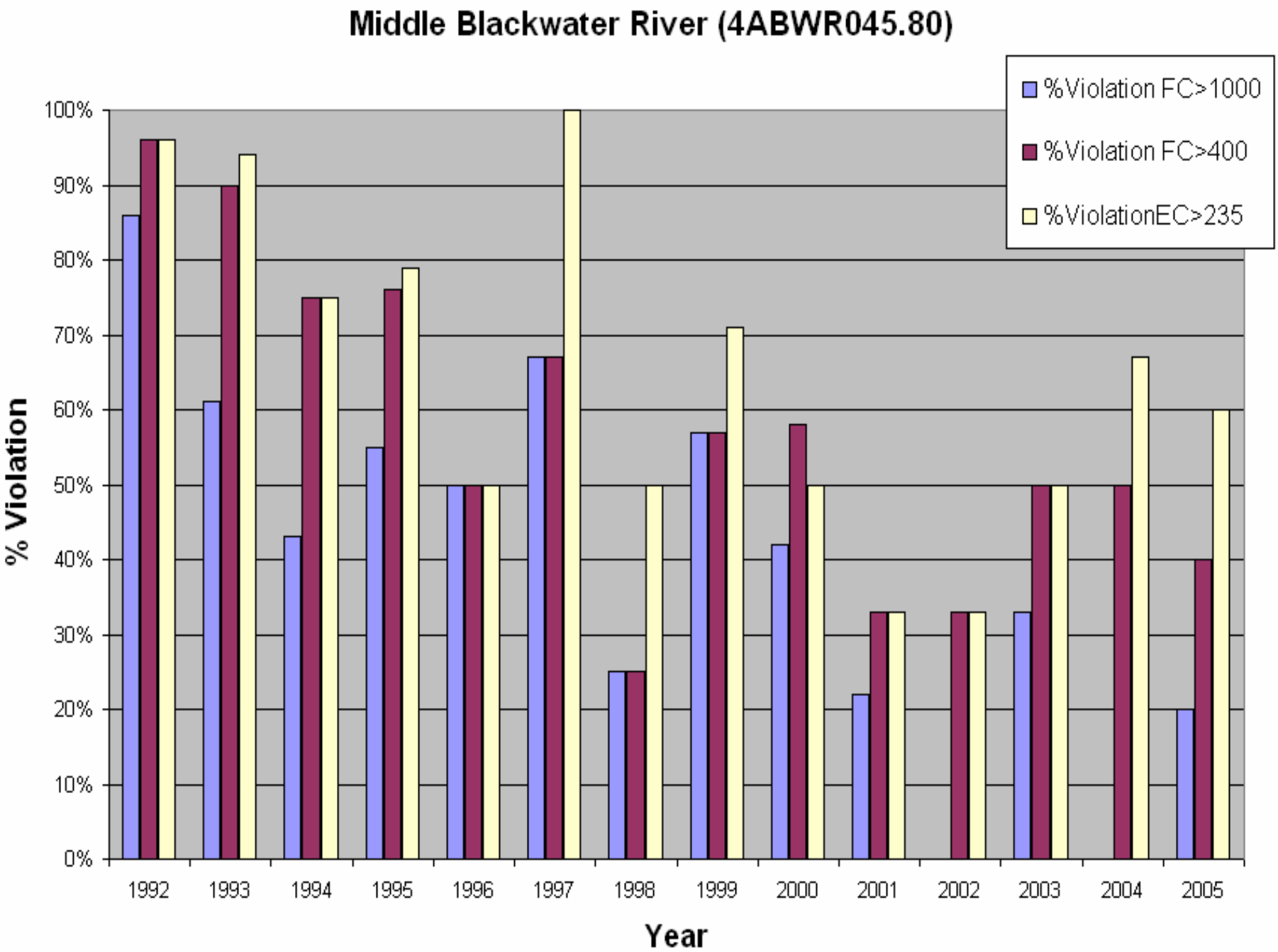
Middle Blackwater River (4ABWR045.80)
%Violation FC>1000
%Violation FC>400
%ViolationEC>235
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60%
50%
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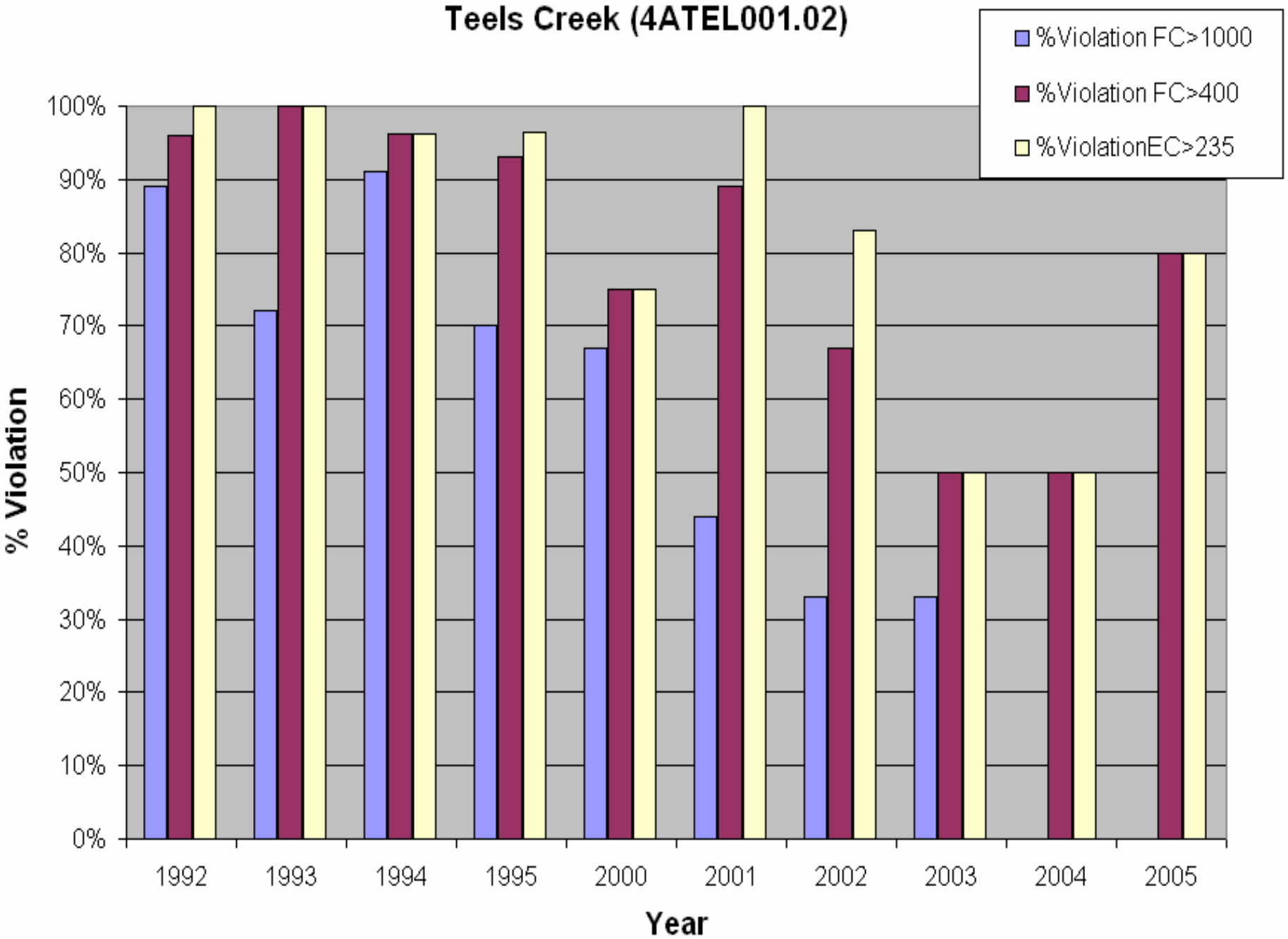
Teels Creek (4ATEL001.02)
%Violation FC>1000
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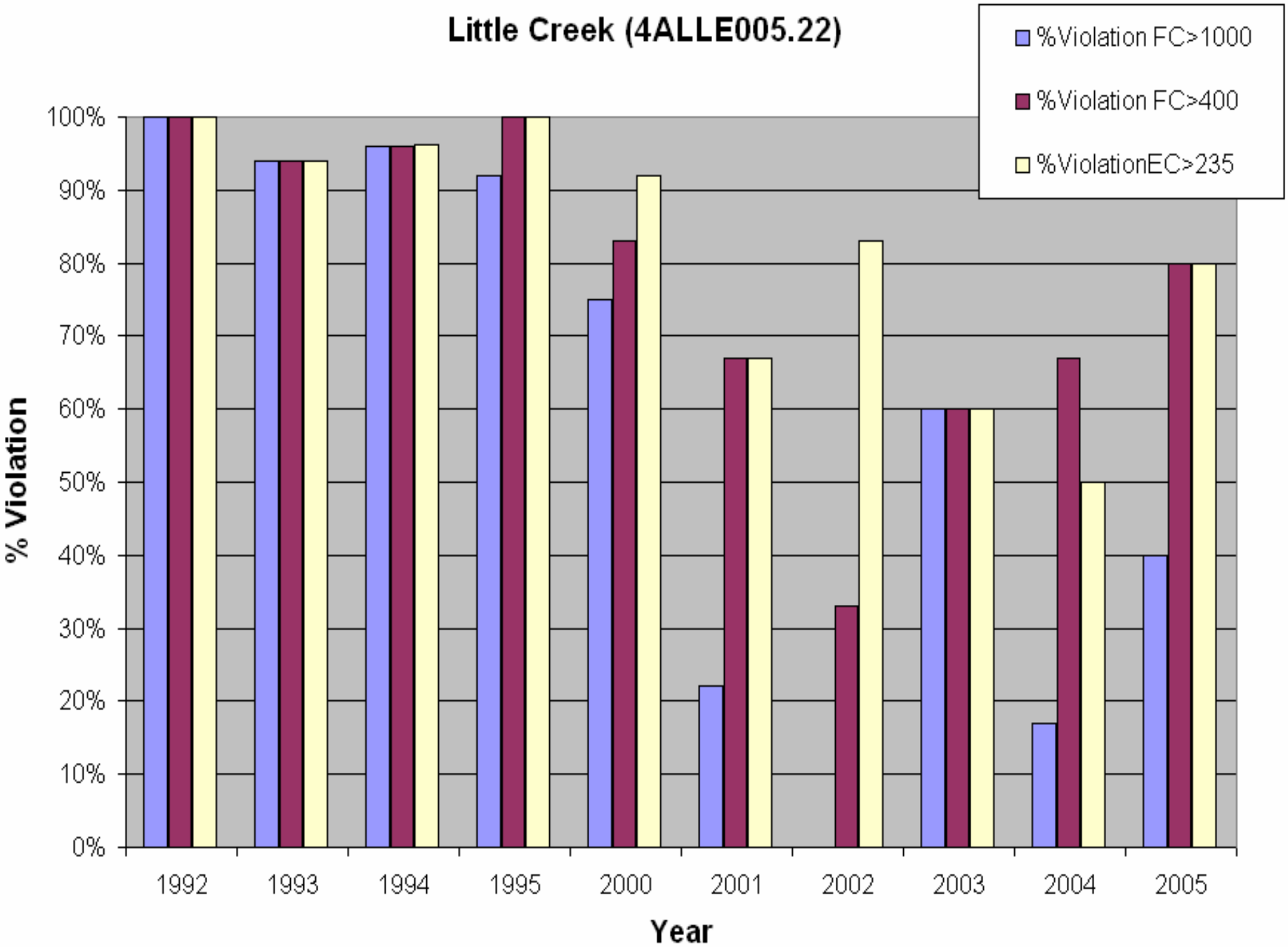
Little Creek (4ALLE005.22)
%Violation FC>1000
%Violation FC>400
%ViolationEC>235
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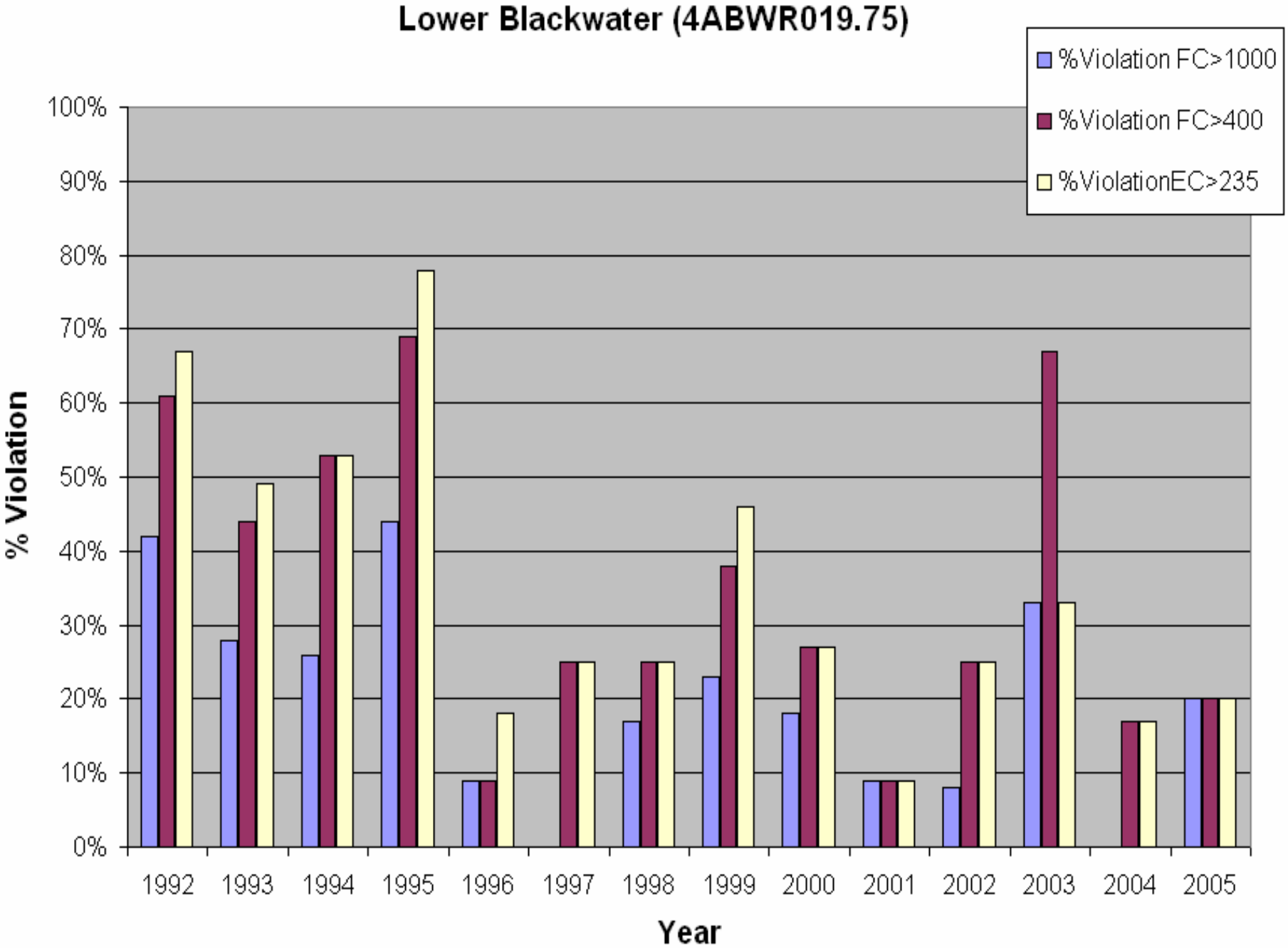
Lower Blackwater (4ABWR019.75)
%Violation FC>1000
%Violation FC>400
%ViolationEC>235
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2005
Year

Trend Analysis Update: 4ABWR032.32

Dr. Carl Zipper, VT

Dates: 1979 to 1995

Observations: 124

Kendall's Tau: 0.19

Slope: +10

Median: 300

Significant?: *Slightly Increasing*

DEQ Update

Dates: 1979 to 2003

Observations: 153

Kendall's Tau: 0.0973

Slope: 0

Median: 300

Significant?: *No Trend*

Trend Analysis Update: 4ABWR019.72

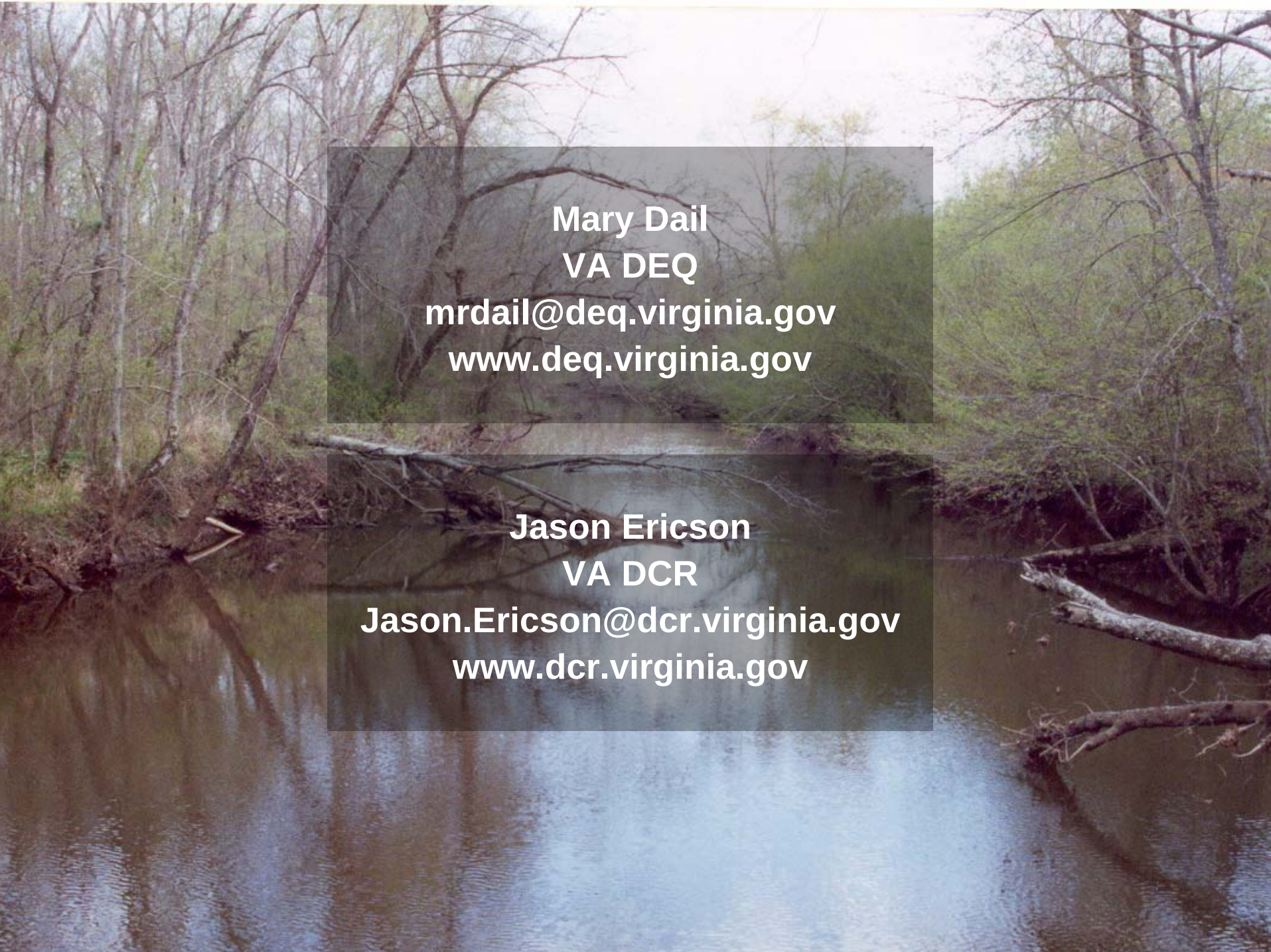
Dr. Carl Zipper, VT	**DEQ Update**
Dates: 1972 to 1997	Dates: 1979 to 2004
Observations: 262	Observations: 333
Kendall's Tau: 0.04	Kendall's Tau: -0.0571
Slope: 0	Slope: 0
Median: 200	Median: 200
Significant?: *No Trend*	Significant?: *No Trend*

Benthic Macroinvertebrates

- 2004 – Partial De-list of impaired segment
- April 2006 sample
  - North Fork appears to be improving
  - Visible habitat recovery

Conclusions

- Blackwater River watershed TMDL and IPs received much attention: Ferrum College, BRSWCD
- NPS programs/outreach appear to be improving water quality, but still not meeting state bacteria standards
- Community and local government buy-in and support is critical to implementation success
- Success in the Blackwater has helped with TMDL development in other watersheds



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